

**REMARKS**

Applicants are amending their claims without prejudice or disclaimer in order to more particularly point out the invention and request additional scopes of protection. Applicants are also amending their specification and abstract to eliminate typographical errors. Attached hereto is a marked-up version of the changes made to the specification, abstract and claims by this preliminary amendment.

**INFORMATION DISCLOSURE STATEMENT**

In accordance with Rules 56 and 97, the applicants submit a listing of documents on the attached forms PTO-1449. A copy of each document is also attached. The Examiner is requested to initial the attached forms PTO-1449 and return a copy as an indication that the attached documents have been considered and made of record in this case.

Also, in addition to the related copending applications referenced on page 16 of applicants' specification, applicants direct the Examiner's attention to related copending application serial no. 09/788,574, which corresponds to U.S. Patent No. 6,285,381 assigned to Nintendo Co., Ltd. (one of the two assignees of the present application). That pending application (which is currently being examined by Examiner Bautista of Art Unit 2173) has a first Office Action dated 8/10/2001 in which all claims stand rejected based on U.S. Patent No. 5,830,065 to Sitrick in view of U.S. Patent No. 6,229,904 to Huang et al. alone or in view of U.S. Patent No. 5,880,740 to Halliday et al or U.S. Patent No.

5,659,490 to Imamura. Applicants attach forms PTO-1449 and 892 from that case (as well as such forms from related application serial no. 09/430,169 cited on page 16), and request the Examiner to consider the references listed thereon. Copies of those references are available in the file histories of those related cases; applicants will submit an additional copy upon request.

Also in accordance with Rule 56, applicants apprise the Examiner that certain of the listed documents attached hereto -- namely "*Rare Puts Gamers in the Game*" (IGN 5/12/99); "*IGN's Best of E3 Awards*" (IGN 5/17/99); and "*Perfect Dark Ditches Face Mapping*" (IGN 2/2/00) -- describe a 5/12/99 press showing that took place at the 1999 Electronic Entertainment Expo (E3) trade show in Los Angeles. At that press showing, Nintendo showed an early version of a "*Perfect Dark*" video game then still being developed by the present applicants, that included a feature of mapping a two-dimensional face image onto a three-dimensional video game character. Ken Lobb, the Nintendo employee who conducted the 5/12/99 press showing, has informed the undersigned that the version of *Perfect Dark* he demonstrated to the press on 5/12/99 at the E3 trade show was incomplete, unstable and prone to "crashing" (lock up). Specifically, Mr. Lobb has informed the undersigned that at the time of the 5/12/99 demonstration, *Perfect Dark's* face mapping feature could "lock up" the *Perfect Dark* game because the face images used up a lot of memory -- leaving insufficient memory for at least some types of subsequent game animation sequences to run without locking up or

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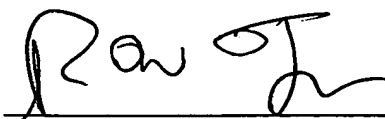
"crashing" the game. Ken Lobb has informed the undersigned that he concealed the lockup problem(s) from press onlookers during the 5/12/99 demonstration by staging the demonstration to avoid showing certain types of animation sequences causing lockups. Specifically, Ken Lobb has informed that undersigned that he avoided demonstrating user control to move an animated character having the user's face mapped thereon, and terminated the demonstration before a lockup could occur.

Should the Examiner have any questions or wish to review any additional information or have any additional facts concerning the 5/12/99 E3 press event or any other issue, the Examiner should contact the undersigned so that applicants can promptly supply such additional information.

Applicants request an early action on the merits. If the Examiner believes a personal interview would be helpful in this case before first action on the merits, the Examiner is invited to call the undersigned at the telephone number listed below.

Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE ABSTRACT**

ABSTRACT OF THE DISCLOSURE

A video/computer game machine is disclosed that maps external images onto animated game players in a game program. An image of a person's face may be mapped onto the head of an animated game player. The person may then play the game using the animated game player having a face that appears to be that of the person. Similarly, images of other persons can be mapped on other animated game players that appear in the video game program. Accordingly, the system improves the realism of video games is obtained by enabling individuals to create animated game players that have features, e.g., a facial image, of the individual or that were selected and imported by the individual.

**IN THE SPECIFICATION**

Page 5, after line 19, insert the following list that currently appears on pages 43-44 of the original specification:

Advantageous features of preferred exemplary embodiments include:

- Identifying coordinates on 2D image to be mapped to triangles that form a 3D face;
- Still image editor for user of a video game;
- Image editor that allows editing of image in 2D and 3D modes;
- 2D image editing while 3D mapped image is being displayed in real time to show effect of editing;

- Selection of various 3D heads on which to map a 2D image, and manipulation of those 3D heads to improve appearance of 2D face mapped on the head;
- 3D head manipulation of both front view shape and front-to-back distance of head;
- Portable storage of a personalized game player;
- Random placement of personalized game player faces onto computer controlled players, such as guards;
- Mapping of 2D image on 3D face;
- Using a digital camera mounted on a hand controller to take pictures for a game console;
- Using a digital camera mounted on one hand controller where a 2D image capture memory resides in the digital camera, and a memory for storing a 3D head mapped with the 2D image is attached to the same or another hand controller;
- Personalize game player having a face of the user.

The paragraph beginning at page 7, line 18:

FIGURE 15 is an exemplary video game screen image showing a 2D facial image mapped on a head and a prompt to save this personalized heads;

The paragraph beginning at page 8, line 9:

FIGURES 20 and 21 are exemplary video game screen images of an image editor having controls for manipulating the shape of a 3-D head, and

The paragraph beginning at page 8, line 14:

Fig. 1 is a block diagram of a game system according to one embodiment of the present invention. The machine is, for example, a game machine 10 (e.g., the product "Nintendo 64") utilizing an advanced technology, such as 32 or 64 bits, which is a high in processability (i.e., processing capability, for example, in CPU bit number, CPU program processing capability per unit time or image representability). The machine uses a removable memory cartridge 12 (hereinafter referred to as "cartridge") as one example of an external memory medium for storing game programs, and other data.

The paragraph beginning on page 9, line 1:

Controllers 16a, 16b, such as hand controllers, are electrically connected to the machine 10 typically via wires 17, although a wireless connection may be used. The hand controller has a joystick, buttons, keys and other user input devices for interactively controlling game play as displayed on a television 18. In addition, the hand controller includes an electrical connector 24 which provides a data connection between a removable data transfer pack 26 plugged into the controller and a processor in the game machine. A transfer cartridge is disclosed in pending U.S. Patent Application Serial No. 09/189,797, entitled "Game System Operable With Backup Data On Different Kinds of

Game Machines" and filed November 12, 1998, and the entire contents of which is incorporated by reference. The data transfer pack includes a connector 28 for electrically connecting to other game cartridges, a memory pack cartridge or to a cartridge with digital camera 14, as is disclosed in pending U.S. Patent Appln. Serial No. 09/430,169, entitled "Portable Game Machine Having Image Capture, Manipulation and Incorporation" filed October 29, 1999, the entire contents of which is incorporated by reference. The digital camera cartridge 14 may be used in connection with the transfer cartridge 26 to interface the digital camera cartridge to the machine, via the transfer pack and controller. An advantage of inserting the digital camera cartridge into a hand-held controller is that a user may easily align the field of view of the camera with a desired subject simply by holding and positioning the controller and camera. In addition, a digital camera cartridge may be inserted into a connector of the controller, while at the same time a game cartridge 12 having an image editor and game program may be inserted in a cartridge connector of the machine. In addition, the digital camera may be inserted into a first hand controller 16a, and a second hand controller 16b may be used to input user control information for capturing, editing and a-saving an image and to connect to a memory pack (not shown in Figure 1) for storing data regarding the image and associated personalized 3D head of an animated game player.

The paragraph beginning on page 10, line 14:

FIGURE 2 is an exploded view showing the structure of a camera cartridge 14. The camera portion is integrally formed on the upper portion (upper edge) when viewed from the front of the housing 50a, 50b, which contains an electrical circuit having electronics to support the digital camera, memory for storage of 2D digital images and a connector 54 for coupling the camera cartridge to a game machine and data pack. The housing is formed, for example, in a flat, vertically elongated rectangular parallelepiped shaped having a prescribed thickness. The connector 54 is provided inside an opening in the cartridge housing 50 a, b, opening for contacting with a terminal (e.g., edge connector) of a substrate 52 included in the cartridge to electrically connect a circuit on the substrate to an electric circuit in the housing. The camera cartridge 14 includes a generally spherical camera housing 20a, 20b containing an image pickup device, e.g., lens 22 and CCD 30, and is supported rotatably (in a lateral direction when viewed from the front by the supporting portion) on a mounting 32a, 32b on the housing of the cartridge.

The paragraph beginning on page 11, line 21:

In this manner, the supporting portion rotatably supports the camera portion in a lateral direction of the body portion to allow the user to easily change the shooting range by simply changing the direction of the camera portion and also to shoot and display the forward direction of the user and the user himself/herself (or the backward direction of



the user) on the image display device when the rotation range is selected to approximately 180 degrees. Further, the supporting axis with which the supporting portion supports the camera portion is inclined to allow the user to freely adjust the shooting range in the forward direction or on the user side by only slightly including both wrists when holding the housing with both hands, without requiring the user to take an uncomfortable position when adjusting, thereby ~~and~~ reducing the fatigue of the wrists.

The paragraph beginning on page 12, line 14:

The game machine 120 includes a CPU 121 that is connected to an input/output interface 122 (hereinafter referred to as "I/O"). To the I/O are connected ~~to~~ connectors 123b, 123d for connection with a hand controller 124. Where the game machine 120 is usable for a game in which a plurality of players participate at a same time, a plurality of sets of connectors and controllers are provided. The hand controller 124 may also include a connection 150 to a portable memory pack 115, having a read/write memory for storage of user data, e.g., facial images, to be used during game play. The memory cartridge connectable to the hand controller incorporates, by mounting on a substrate, a non-volatile memory (e.g., ROM, EP-ROM; hereinafter referred to as "ROM") for storing image files, editing files and identification codes.

The paragraph beginning at page 13, line 15:

FIGURE 4 is a block diagram of the components for capturing an image of a subject 300, e.g., a face of a person. Light reflected off of the subject towards the digital

camera cartridge 304 and is focused by a lens 302 on a charged-coupled-semiconductor device (CCD) 306. The CCD generates electrical signals representing an image of the subject. An analog-to-digital converter 308 converts the electrical signals into a digital image of the subject. The digital image is formatted by another converter 310 into a digital file that is stored in a RAM memory 312 in the camera cartridge 304. The memory 312 may save several digital image files representing ~~pictures of different~~ pictures. In addition, these image files can be written into memory over existing files, so as to erase those overwritten image files.

The paragraph beginning on page 16, line 3:

During image capture, an oval template 1004 is displayed on the screen to prompt the user to center his face in image capture area. During the "Take Picture" menu (Fig. 10) the current visual image as being received by the camera is displayed on screen, and is updated by the camera at around 2 times per second. A blue transparent overlay template 1004 highlights a vertical oval area of the image which is deemed to be the ideal position for the user to position his or her face. Face images that fit correctly with this oval will need little fine tuning and as such the whole capture/editing process is speeded up by properly positioning the user's face in the oval. The user moves before the camera so that his head is centered in the oval template shown in real-time on the screen.

The paragraph beginning on page 17, line 7:

A facial image may also be selected by choosing one of the stored 2D images in the camera cartridge (Fig. 9) or by choosing an personalized 3D animated game player stored in a game pack or other memory device coupled to the game pack, controller or machine. If a personalized 3D head is selected (S64), the user may be first prompted to identify the game mode, e.g., multi-player combat, single player missions or both, in step S66. The user is then presented on the display with the 3D personalized heads for selection in S68. The user may then begin game play or edit (S70, S72, S74) the existing head.

The paragraph beginning at page 17, line 21:

Once a pre-existing image is selected, the image is transferred from the camera memory to memory in the game machine, in step S80. Regardless of whether the image is a pre-existing image or an image captured from a real-time camera image, the program saves the image in temporary memory in the game machine so that the image may be applied to a head and edited, in step S82. The mapping of a 2D image onto the head may occur during start-up of each game (as the existing heads are readout of the memory pack) and, during the editing process, as 3D heads and 2D facial images are being edited. The major portions of each 3D head are its face, hair and sides (neck and sides around the ears). The two-dimensional facial image 1200 is mapped to the face portion 1204 of the 3D head 1206, as is shown in FIGURE 12. The hair 1206 and sides 1208 of the head are

not mapped with a 2D image. The 3D face area 1202 is a 3D generally oval surface. This face area surface is defined mathematically by computer software as triangles, e.g., 20 triangles, that when assembled together form a 3D surface of the face of the head. To generate a 3D face, to be inserted in a head that may be oriented from the front, side, looking-up, looking down or other point of view, the computer determines the location and position of each of the triangles that define the face. The location in three-dimensions of the surface of the face is determined, determining the location of each of the mathematically defined triangles that form the 3D face image.

The paragraph beginning at page 18, line 18:

The 2D facial image is applied to the 3D face by mapping the 2D image to the triangles that form the 3D face. For mapping, the 2D image is segmented into triangular sections that correspond to the 3D triangles of the face. The segmentation is done by identifying three points on the 2D image that correspond to the corners of each triangles of the 3D face. The section of the 2D image within the triangle defined by each of the three identified points is mapped onto the corresponding triangle of the 3D face. For example, one of the triangles of the 3D face portion may correspond to the nose of the face. To map the nose of the 2D image to the 3D nose triangle, three points on the 2D image are identified that outline the nose shown in that 2D image. The 2D image within the triangle defined by the three selected points are mapped to the triangle corresponding to the nose of the 3D face. Similarly, the other triangular sections' 2D image are mapped

to the other triangles that make up the 3D face. The mapping of the 2D image onto a 3D face is accomplished each time the video game starts up and during editing.

The paragraph beginning at page 20, line 24:

To calculate the transformed (texture) co-ordinates, equations 4 and 5 are applied to each vertex, S1310, S1312, S1314 and S1316.

The paragraph beginning at page 21, line 8:

The stored 3D "heads" which the user selects are stored in the game program (or memory controller pack) as "slots" S82. When completed, the one slot contains all the information to generate a custom character head. This includes face texture information, hair and face colors, head type, etc. The game allows multiple slots for multiple heads that can be used in the single player version of the game where the custom heads can be used for either your player character's head or that of a random guard or other computer-controlled game character.

The paragraph beginning at page 22, line 6:

Once a facial image has been selected, the user is prompted to apply the image to an animated three-dimensional head, in step 568 and shown in FIGURE 15. The machine may have stored several, e.g., five, animated 3D heads which are used to create animated game players. These heads may be male or female, and have different shapes, hair color and skin tone. The heads are presented on the display as individual 3D head images. The

heads may haveing blank faces, a computer generated face or have the face of the 2D facial image that has been captured and selected for use in creating a personalized head. The heads may move, e.g., turn from side to side and tilt up and down, so that the user may see the head from different angles. The user selects a head on which to apply the facial image that has been captured.

The paragraph beginning at page 23, line 14:

To edit an animated 3D head with a mapped 2D facial image, the user selects one of several available editing functions, including selecting a new 2D facial image S86, select a new 3D head S88, reposition the 2D facial image S90, adjust the 3D shape of the head S92, change the hair color and skin tone of the head S94, delete the saved head S96, cancel any changes S98 that have been made to a saved head during the editing process, and save any changes made to the head and facial image S100.

The paragraph beginning at page 23, line 21:

In particular, the editor contains various sections to alter the characteristics of the current head, these including:

***Take Another Picture (S86)***

This option leads to the “Take Picture” menu allowing the user to change the image that is mapped on-to the head’s face.

***Change Head (S88)***

The “Change Head” function allows the user to alter his or her choice of the special face mapping enabled character heads.

***Position Picture (S90)***

This menu allows the user to change which parts of the captured image are mapped onto the head’s face. Five control handles allow the size, shape and position of the aforementioned oval area to be altered, as is shown in FIGURE 19.

The software maps the 2D image that falls inside this oval on-to the facial area of the head. An additional “Brightness” feature allows the user to change the brightness of the facial image helping to disguise the joint between the face and the rest of the head.

The paragraph beginning at page 24, line 15:

The editing by the user of the captured 2D image S90 includes:\_, adjusting the position of the oval template over the 2D image, expanding and contracting the oval shape about the major and minor axes (length and width) of the oval, and adjusting the brightness of the 2D image 1900 in Fig. 19. The oval template 1902 defines the portion of the 2D image that will be mapped to the 3D face. The template is translucent so that the entire 2D image (both inside and out of the template) may be viewed\_\_ which facilitates the positioning of the template on the 2D image. The template can be moved with respect to the 2D image by use of cursor commands and drag points that are on the

rim of the oval and that can be manipulated by the user with the hand controller and a cursor that appears on the image in Figure 19.

The paragraph beginning at page 25, line 3:

Moving the template with respect to the image allows the user to better aligns his face in the oval template and, thereby, adjusts the alignment of the facial image on the 3D head 1904. Expanding and contracting the length and width of the oval also allows a user to better position his facial image within the oval and, thus, onto the 3D face.

The paragraph beginning at page 25, line 19:

The 2D image editor may also automatically balances the contrast of the image to reduce the unintended effects of shading on the 2D image. These shading effects can cause poor 3D visual effects when the 2D image is mapped on the 3D face. To balance the contrast, the image editor compares the brightness of the left side of the image to the right side of the image. If the brightness between the two sides varies excessively, such as by more than 10%, then the editor reduces the brightness on the bright side of the image and may increase the brightness on the dark side of the image. In addition, the brightness/darkness adjustments are more pronounced at the edges of the oval image than at the center because the brightness adjustments are applied in a linear manner in which the center of the image is not adjusted so as to avoid creating a perceptible contrast change at the center of the image.



The paragraph beginning at page 26, line 8:

When using a digital camera to takes an image in “real” world conditions, it is often found that the brightness of the image is not consistent across the image when measured from left to right. This can create problems with face image mapping as the brightness of the join line at each side of the head is at the same brightness. The join line is the 3D surface line where the face portion of the head meets the sides of the face. If there is a difference in brightness at the join line, the result is a distinct and unwanted shade discontinuity on one or both sides of the mapped head.

The paragraph beginning at page 26, line 16:

In order to combat this effect, “Automatic Shade Compensation” techniques are used during the mapping phase of the operation. This attemptsed to modify the brightness of the 2D-captured image to give a more even mapping without unduly affecting the “look” of the overall image.

The paragraph beginning at page 26, line 20:

This is achieved by applying a non-linear filter to the 2D image, which modifies the intensity of each pixel as a function of pixel position and based upon the following equations. This filter is applied to the whole image, however only pixels within the oval are used to calculate the filter parameters;

The paragraph beginning at page 27, line 3:

$N_{\text{Summed}}$  = Number of pixels used in the summation (i.e. Fall within 25% and 75% bounds)

The paragraph beginning at page 28, line 11:

Note that at  $x=N_x/2$  no intensity changes occur on either side thus preventing a discontinuity from appearing at the center of the image.

The paragraph beginning at page 28, line 19:

***Shape Head (S92)***

The “Shape Head” feature allows the user to alter the three dimensional shape of the current head; as is shown in FIGURES 20 and 21. Control points allow the head to be squashed and stretched in dimensions coplanar to the face and an additional slider allows the depth of the head or scale in the front to back direction to be altered.

The paragraph beginning at page 30, line 4:

***Keep Changes (S100)***

Keeping changes updates the current selected slot with the alterations made during the editing session. Following this the user is again invited to save his or her work to a controller pack.

The paragraph beginning at page 20, line 8:

The personalized heads that were created using the image capture/edit/save functions may be used during game play. Typically, a user will select a personalized head that includes the user's facial image and applies that head to the body of a desired animated game character. In this way, users can personalize game play by having the animated player that they control be a player that has the appearance of the user. During multiple-user combat game play, it would enhance the realism of game play if the animated game players ~~that appear~~ in multi-player game mode.

The paragraph beginning at page 30, line 16:

Moreover, the personalize heads may be applied (in a random manner or some prescribed manner, e.g., all guards have a certain head) to computer controlled game characters, such as guards that appear in a combat game, where the guards are not controlled by any of the game playing users. During game play, any heads that occupied the "Single Player Slots" are randomly selected and used as the heads for that particular level's guard characters. Thus, the user will see personalized computer generated players as he plays a game. In addition, if the slots set aside for multi-player games contain any valid personalized heads then these heads may appear (Fig. 14) as a head option when the player chooses to modify his character's properties. Thus, the player may use or edit any of the saved "heads" in the controller memory pack.

The paragraph beginning at page 31, line 4:

The 2D image and settings made with the editor are stored to save a personalized animated game player. The 2D image and settings may be stored in the user's controller memory pack so that they may be carried by the user from one game console to another. The memory pack plugs into the hand controller and may be carried by the user from game machine to game machine and, thus, allows the user to load his personalized 3D animated game player (including a face that is derived from a 2D image of the user) into any game machine that the user may be playing. Thus, some advantages of using controller game packs for storage of personalized player head is that the user can carry personalized player settings to other game consoles, especially those consoles' owned by friends. Other advantages of a portable personalized player head stored in the controller memory pack include that friends may play each other where each friend has their own personalized player, and personalized images may be formed for the computer controlled players, e.g., automatically generated guards and other "bad guys" to randomly have personalized heads appear on animated figures during the game.

The paragraph beginning at page 40, line 16:

While this invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, the preferred embodiments of the invention, as set forth therein, are intended to be illustrative, not limiting. Various changes may be

made without departing from the true spirit and full scope of the invention, as defined in the following claims.

Delete the list (entitled "ADDITIONAL ELEMENTS TO BE CLAIMED") at page 43, line 6 through page 44, line 1 (this list has been moved to page 5).

### **IN THE CLAIMS**

1. (Amended) A video game system for playing interactive games using a handheld controller that produces game control signals in response to manipulation by a user, and the video game system including a console that generates ~~generating~~ game images, including an animated three-dimensional player, for display during game play, the console including a processor and also having a memory that stores a game program, the system comprising wherein:

a console including a the processor ~~receiving~~ receives said game control signals from the handheld controller, said console generating a display of the animated three-dimensional player, and in response to accessing a memory storing a the game program, the game program including an still image editor program, wherein the editor program includes processor instructions for mapping maps an imported two-dimensional image onto the animated three-dimensional player prior to game play, wherein the game program animates said three-dimensional player to move under control of said game control signals the processor receives from the handheld controller.

2. (Unamended) A video game system as in claim 1 wherein the imported two-dimensional image is an image of a face.

3. (Amended) A video game system as in claim 1 further comprising a digital camera coupled to said processor system, and said digital camera captures the two-dimensional image in real time under control of the game program.

4. (Amended) A video game system as in claim 1-3 wherein the digital camera is included in a removable cartridge insertable into an insertion port associated with the console.

5. (Unamended) A video game system as in claim 1 wherein the processor comprises a microcontroller and a graphics processor.

6. (Amended) A video game system as in claim 1 wherein the memory storing the game program and the video editor is included in a game cartridge insertable into an insertion port associated with the console.

7. (Amended) A video game system as in claim 1 further comprising a player memory electrically coupled to said processor and storing, in the player memory, data indicative of the two-dimensional image as ~~painted~~ mapped onto the three-dimensional ~~player in the player memory~~.

8. (Unamended) A video game system as in claim 7 wherein the player memory is separable from the console.

9. (Amended) A video game system as in claim ~~8~~7 wherein the player memory is a portable removable player-memory cartridge.

10. (Unamended) A video game system as in claim 9 wherein the player cartridge physically connects to the controller.

11. (Amended) A video game system as in claim ~~10~~1 wherein the handheld controller is a hand controller separate from the console.

12. (Amended) A video game system as in claim 1 wherein said handheld controller comprises ~~a~~ first and second handheld controllers each having a player cartridge storing data indicative of different two-dimensional images.

13. (Unamended) A video game system as in claim 1 further comprising a display coupled to said console and showing the three-dimensional player during game play.

14. (Unamended) A video game system as in claim 13 wherein said display is a television.

15. (New) The video game system of claim 1 wherein the image editor provides a coordinate identifier that identifies coordinates on the 2D image to be mapped to triangles for a 3D face.

16. (New) The video game system of claim 1 wherein the image editor is operated by the user of the video game in response to manipulation of said handheld controller.

17. (New) The video game system of claim 1 wherein the image editor allows editing in either a 2D mode or a 3D mode.

18. (New) The video game system of claim 1 wherein the image editor allows editing of a 2D image while displaying the 3D image in real time to show the 3D effects of said editing.

19. (New) The video game system of claim 1 wherein the image editor allows the user to select between plural 3D heads on which to map a 2D image.

20. (New) The video game system of claim 1 wherein the image editor also manipulates a 3D head onto which to map the 2D image, in order improve the appearance of a 2D face mapped onto the head.

21. (New) The video game system of claim 20 wherein the editor provides for 3D head manipulation of both the front view shape and the front-to-back dimension of the head.



22. (New) The video game system of claim 1 further including a portable storage device that stores a representation of a personalized game player.

23. (New) The video game system of claim 1 wherein said image editor maps a 2D facial image onto a 3D head.

24. (New) The video game system of claim 1 wherein the image editor randomly places the two-dimensional image onto computer controlled players.

25. (New) The video game system of claim 1 wherein the image editor maps the 2D image onto a selected 3D head.

26. (New) The video game system of claim 1 wherein the controller includes an insertion slot for receiving a digital camera having a 2D image capture memory disposed therein, said controller insertion slot also receiving a memory for storing a 3D head pre-mapped with the 2D image.

27. (New) The video game system of claim 1 wherein the image editor personalizes a game player to have the face of the user of the video game system.

28. (New) The video game system of claim 1 wherein said video game system includes plural handheld controllers for simultaneous operation by plural associated users each having a video game character associated therewith.

29. (New) The video game system of claim 28 wherein each of said plural video game characters has a personalized face specified by an associated user.

30. (New) The video game system of claim 1 wherein said image editor includes a real time image capture routine that displays a captured image within a template of a predetermined shape.

31. (New) The video game system of claim 30 wherein said template predetermined shape comprises an oval.

32. (New) The video game system of claim 1 wherein the image editor includes a face mapping routine that determines the center of the 2D image relative to a predetermined portion of the three-dimensional player.

33. (New) The video game system of claim 1 wherein the image editor calculates transformed texture coordinates for each of plural vertices of a polygon mesh defining said three-dimensional player.

34. (New) The video game system of claim 1 wherein the image editor permits the user to edit at least one of the color and the shape of said two-dimensional image by manipulating the handheld controller.

35. (New) The video game system of claim 1 wherein the image editor automatically balances the contrast of the image to reduce unintended effects of shading on the image.

36. (New) The video game system of claim 35 wherein the image editor balances the contrast by comparing the brightness of one side of the image to the brightness of other side of the image, and adjusts contrast in response to results of the comparison.

37. (New) The video game system of claim 36 wherein the image editor applies brightness adjustment linearly across the image without adjusting brightness at the center of the image, in order to avoid creating a perceptible contrast change at the image center.

38. (New) The video game system of claim 1 wherein the image editor applies a non-linear filter to the two-dimensional image so as to modify image intensity as a function of position.

39. (New) In a video game playing system, a method of allowing a video game player to interactively map a two-dimensional image onto a three-dimensional animated object comprising:

(a) obtaining a two-dimensional image;

(b) selecting a three-dimensional object comprising a polygon mesh;

(c) changing, under interactive user control, the shape of the polygon mesh in order to provide a more optimal mapping of the two-dimensional image onto the polygon mesh;

(d) texture mapping the two-dimensional image onto the shape changed polygon mesh; and

(e) animating, on an interactive real time basis, the three-dimensional object including the texture-mapped two-dimensional image as part of video game play.

40. (New) The method of claim 39 wherein the animating step comprises controlling the motion of the three-dimensional object in response to interactive user manipulation of a handheld controller.

41. (New) The method of claim 39 wherein the obtaining step (a) includes capturing the two-dimensional image with a digital camera in real time during video game operation.

42. (New) The method of claim 39 further including repeating said steps (a)-(d) to provide multiplayer game play including plural animated texture-mapped three-dimensional objects interactively controlled by different video game players.

43. (New) The method of claim 39 wherein the shape changing step comprises changing the dimensions of at least a portion of said object in at least two dimensions.

44. (New) The method of claim 39 wherein the shape changing step comprises changing the dimensions of at least a portion of said object in three dimensions.

45. (New) The method of claim 39 wherein the two-dimensional image comprises a facial image of an individual having a real-life head shape, and the shape changing step comprises editing the shape of a three-dimensional virtual head to permit reshaping of the three-dimensional virtual head to better conform to the real-life head shape of the individual.

### ABSTRACT OF THE DISCLOSURE

A video/computer game machine maps external images onto animated game players in a game program. An image of a person's face may be mapped onto the head of an animated game player. The person may then play the game using the animated game player having a face that appears to be that of the person. Similarly, images of other persons can be mapped on other animated game players that appear in the video game program. Improved realism of video games is obtained by enabling individuals to create animated game players that have features, e.g., a facial image, of the individual or that were selected and imported by the individual.

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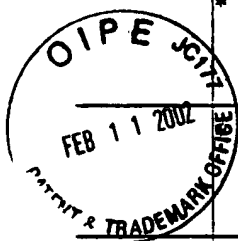
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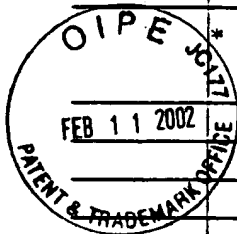
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